JC915 U.S. PTO
10/12/00

10-13-00

A

Matter #701069 19

CERTIFICATE OF EXPRESS MAIL SERVICE NO. EL388608508US

Date of deposit: October 12, 2000

I hereby certify that this paper is being deposited with the United States Post Office, Express Mail Service Post Office to Addressee, with sufficient postage, on the date indicated above and is addressed to: Box Patent Application, Assistant Commissioner for Patents, Washington, DC 20231.

Joanne M. Hoefert

Joanne M. Hoefert

ASSISTANT COMMISSIONER FOR PATENTS
Box Patent Application
Washington, D.C. 20231

Docket No.: 701069.19

JC853 U.S. PTO
09/689383
10/12/00

Sir:

Transmitted herewith for filing is the patent application of:

INVENTOR(S): Macher, Robert J. and Smith, Allen L.

FOR: SOLVENT WELD CEMENT COMPOSITION IN AEROSOL FORM

This patent application is based on Provisional Patent Application Serial No. 60/195,502 filed April 6, 2000.

Enclosed are:

[X] Patent Application with 16 pages of Specification, including 5 pages of Claims and 1 page of Abstract
[X] Combined Declaration and Power of Attorney
[ ] Informal drawings
[X] A Verified Statement Claiming Small Entity Status under 37 CFR 1.9 and 37 CFR 1.27
[ ] Information Disclosure Statement
[ ] Form PTO-1449 and references cited
[X] An Assignment of the invention to Camie-Campbell, Inc. with Cover Sheet and the recording fee of $40.00.
[X] Other: Return Receipt Post Card
[X] A check in the amount of $704.00 to cover the filing fee is enclosed.

The filing fee has been calculated as shown below:

	(Col. 1)	(Col. 2)	SMALL ENTITY			OTHER THAN A SMALL ENTITY	
FOR:	NO. FILED	NO. EXTRA	RATE	FEE	OR	RATE	FEE
BASIC FEE				$355.00	OR		$ 710.00
TOTAL CLAIMS	41-20 =	21	x $ 9	$189.00	OR	x $18	
INDEP. CLAIMS	7-3 =	4	x $40	$160.00	OR	x $80	
MULTIPLE DEPENDENT CLAIM PRESENT		0	+$135	$	OR	+$270	
*If the difference in col. 1 is less than zero, enter "0" in Col. 2			TOTAL	$704.00	OR	TOTAL	$

[X] Prior to examination of the application, please preliminarily amend the application by inserting after the title:

--Cross Reference to Related Application

This application is based on and claims priority of Provisional Patent Application Serial No. . 60/195,502 of Smith et al, for SOLVENT WELD CEMENT COMPOSITION IN AEROSOL FORM, filed April 6, 2000, which is hereby incorporated by reference.--

[X] A check in the amount of $704.00 to cover the filing fee is enclosed.

[ ] Please charge my Deposit Account No. 11-0160 in the amount of $ _____. A duplicate of this sheet is enclosed.

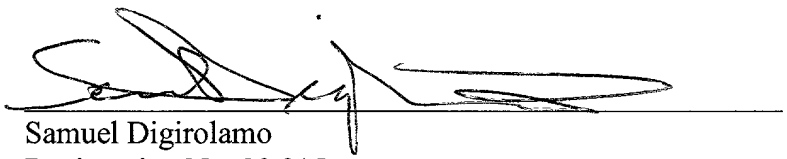
[X] The Commissioner is hereby authorized to charge payment of the following fees associated with this communication or credit any overpayment to Deposit Account No. 11-0160. A duplicate of this sheet is enclosed.

[X] Any additional filing fees required under 37 CFR 1.16.
[X] Any patent application processing fees under 37 CFR 1.17.

[ ] The Commissioner is hereby authorized to charge payment of the following fees during the pendency of this application or credit any overpayment to Deposit Account No. 11-0160. A duplicate copy of this sheet is enclosed.

[ ] Any patent application processing fees under 37 CFR 1.16.
[ ] Any fees under 37 CFR 1.16 for presentation of extra claims.

Date: 12 Oct 00



Samuel Digirolamo
Registration No. 29,915
Blackwell Sanders Peper Martin LLP
Attorneys At Law
720 Olive Street
St. Louis, Missouri 63101-2396
(314) 345-6000

Applicant or Patentee: MACHER et al.
Serial or Patent No.: Not Yet Known Attorney Docket No.: 701069.19
Filed or Issued: Filed Herewith
For: SOLVENT WELD CEMENT COMPOSITION IN AEROSOL FORM

VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY STATUS (37 CFR 1.9(f) and 1.27(c)) - SMALL BUSINESS CONCERN

I hereby declare that I am:

[ ] the owner of the small business concern identified below:

[X] an official of the small business concern empowered to act on behalf of the concern identified below:

NAME OF CONCERN Camie-Campbell, Inc.
ADDRESS OF CONCERN 9225 Watson Industrial Park
St. Louis, Missouri 63126-1581

I hereby declare that the above identified small business concern qualifies as a small business concern as defined in 13 CFR 121.3-18, and reproduced in 37 CFR 1.9(d), for purposes of paying reduced fees under Section 41(a) and (b) of Title 35, United States Code, in that the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement, (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time, part-time or temporary basis during each of the pay periods of the fiscal year, and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third-party or parties controls or has the power to control both.

I hereby declare that rights under contract or law have been conveyed, to and remain with the small business concern identified above with regard to the invention, entitled SOLVENT WELD CEMENT COMPOSITION IN AEROSOL FORM by inventor(s) MACHER et al. described in the specification filed herewith.

If the rights held by the above identified small business concern are not exclusive, each individual, concern or organization having rights in the invention is listed below* and no rights to the invention are held by any person, other than the inventor, who would not qualify as an independent inventor under 37 CFR 1.9(c) if that person made the invention, or by any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

*NOTE: Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27).

NAME _____
ADDRESS _____
_____

[ ] INDIVIDUAL [ ] SMALL BUSINESS CONCERN [ ] NONPROFIT ORGANIZATION

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitled to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

NAME OF PERSON SIGNING Robert J. Macher

TITLE OF THE PERSON OTHER THAN OWNER President
ADDRESS OF PERSON SIGNING 777 River Hills Drive, Fenton, Missouri 63026

SIGNATURE Robert J Macher DATE 10/10/00

SOLVENT WELD CEMENT COMPOSITION IN AEROSOL FORM

CROSS-REFERENCE TO RELATED APPLICATION

This application claims priority to provisional application Serial No. 60/195,502, filed April 6, 2000.

BACKGROUND OF THE INVENTION

The present invention relates in general to an aerosol solvent weld cement and pertains more particularly to a solvent weld cement composition which comprises at least one polymer resin, at least one welding solvent, and at least one conventional propellant, the solvent weld cement being stable when stored in and dispensed from an aerosol container. The solvent weld cement (SWC) of the present invention is an improvement over conventional SWC since SWC has not previously been successfully stored and dispensed by aerosol means.

Plastic pipe, primarily polyvinyl chloride (PVC) and post chlorinated polyvinyl chloride (CPVC) is commonly used as underground water pipe and for other applications. Plastic pipe is replacing ceramic and metal pipe due to its reduced weight, lower cost, and resistance to cracking under stress. Another advantage of plastic pipe is the capability of forming watertight junctions when attached using SWC in contrast to ceramic pipe interference fittings and metal pipe welded joints. The use of SWC allows joining of the pipes by relatively unskilled workers as compared to the use of welding or soldering equipment with metal pipes.

Unfortunately, application of the adhesive to the pipefittings and joints often takes place within trenches, where there is no convenient location to place the SWC container. SWC is conventionally applied in liquid form with a swab from an open container. The open container releases fumes into the atmosphere, and allows air and moisture to contaminate the remaining

SWC. In addition, the open containers are susceptible of being contaminated with dirt or debris, which may affect the performance of the SWC. Further, the container is easily spilled, contaminating the soil with hazardous substances, as well as increasing the time and resources necessary to complete the job.

The application of a liquid SWC by use of a swab or brush does not consistently provide optimum uniformity of application. This can result in incomplete bonding of the joints where too little SWC is applied, and waste as well as environmental concerns where the application is excessive.

Solvent weld cements have not been previously stored and dispensed by aerosol means. Use of an aerosol dispensing system would provide ease of application and the prevention of environmentally unkind spills.

SUMMARY OF THE INVENTION

Accordingly, it is an object of the present invention to provide a SWC that can be stored in an aerosol container without gelling of the SWC.

Another object of the present invention is to provide a SWC that can be dispensed by aerosol means.

Still another object of the present invention is to provide a SWC that can easily and uniformly be applied using one hand.

Yet another object of the present invention is to provide a SWC that is dispensed from a container which is not open for solvent evaporation, oxidation or physical contamination of the SWC.

A further object of the present invention is to provide a SWC that cannot be spilled by the user, thereby preventing ground contamination by the SWC.

Still a further object of the present invention is to provide a SWC that can be applied quickly thereby providing additional working time or set up time before the SWC hardens.

Yet a further object of the present invention is to provide a SWC in an aerosol container which complies with current volatile organic compounds (V.O.C.). requirements as mandated by federal and local governments.

To accomplish the foregoing and other objects of this invention there is provided a SWC composition that can be stored in and dispensed from an aerosol container without gelling of the SWC. The SWC composition disclosed herein is easily and uniformly applied, and it allows the user a longer set up time in which to complete the joints as compared to the conventional swab application method. Further, the SWC provided herein is not vulnerable to solvent loss and hence gelling, oxidation or physical contamination, and cannot be spilled during application. It has been discovered that the SWC disclosed herein meets all of the objects of the present invention.

The SWC composition comprises a polymer resin, preferably CPVC or a CPVC/PVC blend, partially dissolved in a solvent mixture including tetrahydrofuran (THF), cyclohexanone, butyrolactone and acetone. The composition further comprises a viscosity modifier/flow control agent, an organotin compound, and an optional dye, utilized to aid in application. The composition is then mixed with a propellant, preferably dimethyl ether, and packaged in a conventional nonferrous aerosol container.

Solvent based adhesives such as SWC work primarily by two means of action. First, the solvent portion of the formulation softens the outer surfaces of the pipe. Then, as the solvent evaporates, the pipe surfaces harden or "cure". Second, as the solvent evaporates, the

resin dissolved in the adhesive dries. The resin acts to fill the small gaps between the pipe and the fittings and to increase the viscosity of the product.

These and other objects and features of the present invention will be better understood and appreciated from the following detailed description of the following embodiments, selected for the purposes of illustration.

DETAILED DESCRIPTION

The presently preferred polymer resin in the SWC composition is CPVC, or a CPVC/PVC blend. Use of a formula including CPVC resin results in the SWC being considered a "universal" pipe cement, as it is suitable for joining PVC, CPVC, Acrylonitrile Butadiene Styrene (ABS) and butyrate pipe. Other polymer resins, including but not limited to PVC, ABS, acrylic resins and blends thereof, may be utilized in the aerosol SWC of the present invention, however, the resulting SWC will not be a universal cement as defined above.

The percent resin utilized is determined by many factors, including the ASTM standards, D-3138-95, F-493, D-2564. (All percentages given herein are wt/wt % based on the total weight of the composition unless otherwise indicated.) In addition, as the percent resin increases, the instability of the product due to premature gelling increases exponentially. The preferred percent of resin in the composition is about 14.5 to 20%, more preferred about 14.5 to 16.0% with about 14.5% being most preferred, resulting in a SWC containing about 10-11% resin solids. This percent meets ASTM standards, provides satisfactory strength of bond, and resists gelling during storage.

The presently preferred solvent system is a mixture of tetrahydrofuran (THF), cyclohexanone, butyrolactone and acetone. This solvent system meets or exceeds current government mandated V.O.C. requirements THF is utilized because it easily dissolves the

polymer resin, and instantly softens or etches the surface of the pipe or fittings to be joined, resulting in a more secure attachment. The preferred range of THF is about 20 to 45%, more preferred is about 20 to 30%, and most preferred is about 26%.

Cyclohexanone is utilized to lengthen the working time, or set-up time, of the SWC, as cyclohexanone has a lower vapor pressure than THF. This component is important because by extending the working time the SWC becomes easier to use. The presently preferred range of cyclohexanone is about 0 to 20%, more preferred is about 5 to 10% and most preferred is about 7%.

Another solvent, butyrolactone, is added in the following percentages. The preferred range of butyrolactone is about 1 to 15%, more preferred is about 2 to 8%, and most preferred is about 5%. This solvent is utilized because it has a lower vapor pressure than cyclohexanone, which aids in further lengthening the working time of the SWC. At the same time, butyrolactone dissolves the polymer resin better than cyclohexanone.

Acetone is added to the composition in the following percentages. The preferred range of acetone is about 10 to 40%, more preferred is about 20 to 30%, and most preferred is about 26%. While acetone is a poor solvent for CPVC resins, it is utilized in order to remain compliant with the federal government's maximum volatile organic compounds (V.O.C.) requirements. Unfortunately, acetone is also a source of water contamination. Water is the primary cause of premature product gelling. Higher percentages of acetone therefore increase product instability.

Additional components may be added to improve the performance of the SWC, such as viscosity modifier/flow control agents including but limited to fumed silica, clays and mixtures thereof. Presently preferred is fumed silica, AEROSIL by Degussa, or Cab-O-Sil by

Cabot Corporation. Controlling the viscosity is required to insure that the SWC clings to and remains in place on the pipe and/or fittings until the pieces are mated together. The presently preferred percentage of fumed silica is about 1.5 to 5.5%, more preferred is about 2.5 to 4.5%, and most preferred is about 3.5%.

An organotin compound is preferably added as a stabilizer. Acceptable organotin compounds include alkylated tin IV compounds, dibutyltin dilaurate, di-n-octyl tin dimercaptide, dibutyltin thioesters, di-n-octyltin maleate, dibutyltin carboxylates and dibutyltin dithioglycolates. Presently preferred is ADVASTAB® TM-161, by Morton International Inc., a methyltin mercaptide, composed of dimethyltin bis(2-ethylhexylthioglycolate) CAS#57583-35-4 approximately 60-100wt% and methyltin tris(2-ethylhexylthioglycolate)CAS#a57583-34-3 approximately 10-30wt% and its thio ester approximately 1-5wt%, also known as tin soap. It is utilized herein as a stabilizer to prevent premature degradation of the CPVC resin, which contributes to gelling problems. The presently preferred range of ADVASTAB is a composition percentage of about 0.25 to 1.00%, most preferred is about 0.5%.

A dye may be added to the composition to facilitate application, as the composition is difficult to see when sprayed on polymer pipe. The dye does not serve any other purpose, and is not necessary for satisfactory performance of the SWC composition. The presently preferred dye is Keystone Purple 706-404-40, preferably about 182g per 50 gallons of SWC.

Suitable propellants include dimethyl ether, propane, butane and isobutane Dimethyl ether (DME) is the presently preferred propellant for this composition. The presently preferred range of dimethyl ether is about 10 to 50%, more preferred is about 20 to 40%, and most preferred is about 30%. DME is preferred because it has the highest solvency by a wide

margin of any propellant currently used in aerosol packaging.

The presently preferred container means for the SWC composition includes stainless steel, glass and aluminum, with aluminum being presently most preferred.

Any conventional aerosol spray nozzle system may be utilized, as the SWC does not require any special spraying equipment. A container with a 360° spray anyway valve and an unrestricted actuator is presently preferred as this configuration will allow the SWC to be sprayed from any angle, or direction, even upside down. This aids in evenly applying the SWC under typical application conditions.

Example

A mixing tank is charged with 30 lbs. of THF by SISAS Inc, using a 1-inch diaphragm or other appropriate pump. The mixer is turned on a slow speed and 14.4 lbs. of resin grade CPVC, TempRite CPVC Resin CAS#68648-82-8 by B.F.GOODRICH, is added. These components are then mixed for 15 to 30 minutes on low speed, checking for resin cut in. Fumed silica, 4.9 lbs. of AEROSIL 200 (Degussa) is added and mixed until a homogenous mixture is formed. An additional 7 lbs. of THF is then introduced to achieve first solids. The following components are then added in the order listed: 7 lbs. of butyrolactone, by International Specialty Chemical; 10 lbs. of cyclohexanone by BASF Corp; 26 lbs of acetone by Eastman Chemical; and 0.6 lbs. of ADVASTAB TM-161 by Morton International Inc.

After mixing until a homogenous mixture is formed, solids and viscosity levels are checked. Final adjustments of the solids should be made with a solvent mixture of 60% THF and 40% acetone. Presently preferred are solids 19% +/-2.0%, and viscosity 1650 +/- 300 centipoise with spindle 3 at a speed of 12 on a Brookfield DV-E viscometer or equivalent.

A dye is then added, 182.1 grams of Keystone Purple 706-404-40 per 50-gallon

drum of SWC.

The SWC is then filtered through a 150-micron bag prior to pumping into storage containers. The resultant SWC is then packaged into aluminum aerosol containers with the propellant, 30% by wt dimethyl ether. The containers, manufactured by CCL Container, are then fitted with Seaquist AR spray anyway valves and Seaquist RAR-8 actuators.

The SWC composition was tested for storage stability. The Advanced Monobloc Aerosol Division of CCL Container, the company which produced the aluminum containers in which the SWC product was packaged, has tested the stability of the SWC during storage. Under accelerated shelf life storage conditions (100 degrees F), the SWC was found to be 100% stable, no gelling, after 90 days.

In addition, the following shelf life storage tests were conducted:

Conditions	Testing Period	Results
Ambient temperature	2 years	100% stable
Accelerated conditions	**Testing Period**	**Results**
120° F	180 days	100% stable

From the foregoing description those skilled in the art will appreciate that all of the objects of the present invention are realized. A SWC has been provided which can be stored in and dispensed by aerosol means without gelling of the SWC. The aerosol SWC can be easily, quickly and uniformly applied using one hand, resulting in a longer working time for the SWC. Finally, the SWC is dispensed from a container which both protects the SWC from solvent evaporation, oxidation and physical contamination, while protecting the environment by preventing unwanted spills.

While a specific embodiment has been shown and described, many variations are

possible. A commercially available nozzle and actuator has been disclosed, but any suitable aerosol means may be substituted. While an aluminum aerosol container is presently preferred, any non-ferrous container may be used. Further, while one of the primary benefits of the SWC composition of the present invention is its compatibility with aerosol means, the SWC may be applied using any conventional method, including but not limited to rolling, brushing and non-aerosol spray methods.

Although the presently preferred solvent system has been described, many variations are possible. Of note, the cyclohexanone portion of the solvent may be replaced by THF, butyrolactone, and mixtures thereof.

The fumed silica AEROSIL 200 is the preferred viscosity modifier, but clays or other silica may suitably be substituted. Finally, the dye Keystone Purple is preferred, but any suitable dye in any concentration that does not interfere with the performance of the SWC may be utilized.

Having described the present invention in detail, those skilled in the art will appreciate that modifications may be made of the present invention without departing from its spirit and scope. For example, although the present aerosol solvent weld cement composition has been described with reference to joining two polymer or plastic type pipes, it is recognized and anticipated that the present composition can be utilized to join any two polymer type members. Therefore, it is not intended that the scope of the present invention be limited to the specific examples and embodiments described herein. It is also contemplated that other modifications and applications, or equivalents thereof, will occur to those skilled in the art. It is accordingly intended that the claims set forth below shall cover all such changes, modifications, variations and other uses and applications that do not depart from the spirit and scope of the

present invention as described herein.

Other aspects, objects and advantages of the present invention can be obtained from a study of the disclosure and the appended claims.

CLAIMS

What is claimed is:

1. An aerosol solvent weld cement comprising:
about 14.5 to 20.0 wt % of at least one polymer resin;
about 30 to 75 wt % of at least one solvent in which the polymer resin can be dissolved; and
about 10 to 50 wt % of at least one aerosol propellant.

2. The aerosol solvent weld cement of claim 1 wherein the polymer resin is selected from the group consisting of CPVC, PVC, ABS, acrylic resins and mixtures thereof.

3. The aerosol weld cement of claim 1 wherein the solvent is selected from the group consisting of tetrahydrofuran, cyclohexanone, butyrolactone, acetone and mixtures thereof.

4. The aerosol weld cement of claim 1 wherein the propellant is selected from the group consisting of dimethyl ether, propane, butane, isobutane and mixtures thereof.

5. The aerosol weld cement of claim 1 further including about 1.5 to 5.5 wt % of at least one viscosity modifier/flow control agent.

6. The aerosol weld cement of claim 5 wherein the viscosity modifier/flow control agent is selected from the group consisting of silica, clay and mixtures thereof.

7. The aerosol weld cement of claim 1 further including about0.25 to 1.00 wt % of at least one organotin compound.

8. The aerosol weld cement of claim 7 wherein the organotin compound is selected from the group consisting of alkylated tin IV compounds, dibutyltin dilaurate, di-n-octyl tin dimercaptide, dibutyltin thioesters, di-n-octyltin maleate, dibutyltin carboxylates and dibutyltin dithioglycolates.

9. The aerosol weld cement of claim 1 further including a dye compound.

10. An aerosol solvent weld cement composition comprising:
about 14.5 to 16.0 wt % of at least one polymer resin;
about 30 to 75 wt % of at least one solvent in which the polymer resin can be dissolved;
about 20 to 40 wt % of at least one aerosol propellant;
about 2.5 to 4.5 wt % of at least one viscosity modifier/flow control agent, and
about 0.25 to 1.00 wt % of at least one organotin compound,
whereby the solvent weld cement is stored in and dispensed from an aerosol container.

11. The aerosol solvent weld cement of claim 10 wherein the polymer resin is selected from the group consisting of CPVC, PVC, ABS, acrylic resins and mixtures thereof.

12. The aerosol weld cement of claim 10 wherein the solvent is selected from the group consisting of tetrahydrofuran, cyclohexanone, butyrolactone, acetone and mixtures thereof.

13. The aerosol weld cement of claim 10 wherein the propellant is selected from the group consisting of dimethyl ether, propane, butane, isobutane and mixtures thereof.

14. The aerosol weld cement of claim 10 wherein the viscosity modifier/flow control agent is selected from the group consisting of silica, clay and mixtures thereof.

15. The aerosol weld cement of claim 10 wherein the organotin compound is selected from the group consisting of alkylated tin IV compounds, dibutyltin dilaurate, di-n-octyl tin dimercaptide, dibutyltin thioesters, di-n-octyltin maleate, dibutyltin carboxylates and dibutyltin dithioglycolates.

16. The aerosol weld cement of claim 10 further including a dye compound.

17. An aerosol weld cement composition comprising
about 14.5 to 16.0 wt % of at least one polymer resin;
about 20 to 45 wt % of tetrahydrofuran;
about 0 to 20 wt % of cyclohexanone;
about 1 to 15 wt % of butyrolactone;
about 10 to 40 wt % of acetone;
about 20 to 40 wt % of at least one aerosol propellant;
about 2.5 to 4.5 wt % of at least one viscosity modifier/flow control agent; and
about 0.25 to 1.00 wt % of at least one organotin compound,
whereby the solvent weld cement resists gelling when stored in and dispensed from an aerosol container.

18. The aerosol solvent weld cement of claim 17 wherein the polymer resin is selected from the group consisting of CPVC, PVC, ABS, acrylic resins and mixtures thereof.

19. The aerosol weld cement of claim 17 wherein the propellant is selected from the group consisting of dimethyl ether, propane, butane, isobutane and mixtures thereof.

20. The aerosol weld cement of claim 17 wherein the viscosity modifier/flow control agent is selected from the group consisting of silica, clay and mixtures thereof.

21. The aerosol weld cement of claim 17 wherein the organotin compound is selected from the group consisting of alkylated tin IV compounds, dibutyltin dilaurate, di-n-octyl tin dimercaptide, dibutyltin thioesters, di-n-octyltin maleate, dibutyltin carboxylates and dibutyltin dithioglycolates.

22. The aerosol weld cement of claim 17 further including a dye compound.

23. An aerosol weld cement composition comprising
about 14.5 wt % of at least one polymer resin;

about 26 wt % of tetrahydrofuran;
about 7 wt % of cyclohexanone;
about 5 wt % of butyrolactone;
about 26 wt % of acetone;
about 30 wt % of at least one aerosol propellant;
about 3.5 wt % of at least one viscosity modifier/flow control agent; and
about 0.5 wt % of at least one organotin compound,

whereby the solvent weld cement resists gelling when stored in and dispensed from an aerosol container.

24. The aerosol solvent weld cement of claim 17 wherein the polymer resin is selected from the group consisting of CPVC, PVC, ABS, acrylic resins and mixtures thereof.

25. The aerosol weld cement of claim 23 wherein the propellant is selected from the group consisting of dimethyl ether, propane, butane, isobutane and mixtures thereof.

26. The aerosol weld cement of claim 23 wherein the viscosity modifier/flow control agent is selected from the group consisting of silica, clay and mixtures thereof.

27. The aerosol weld cement of claim 23 wherein the organotin compound is selected from the group consisting of alkylated tin IV compounds, dibutyltin dilaurate, di-n-octyl tin dimercaptide, dibutyltin thioesters, di-n-octyltin maleate, dibutyltin carboxylates and dibutyltin dithioglycolates.

28. The aerosol weld cement of claim 23 further including a dye compound.

29. A method of making an aerosol solvent weld cement composition comprising combining:

about 14.5 to 20.0 wt % of at least one polymer resin;
about 30 to 75 wt % of at least one solvent in which the polymer resin can be dissolved; and
about 10 to 50 wt % of at least one aerosol propellant;

whereby a solvent weld cement that resists gelling when stored in and dispensed from an aerosol container is formed.

30. The method of claim 29 wherein the polymer resin is selected from the group consisting of CPVC, PVC, ABS, acrylic resins and mixtures thereof;

the solvent is selected from the group consisting of tetrahydrofuran, cyclohexanone, butyrolactone, acetone and mixtures thereof; and

the propellant is selected from the group consisting of dimethyl ether, propane, butane, isobutane and mixtures thereof.

31. The method of claim 29 further including combining about 1.5 to 5.5 wt % of at least one viscosity modifier/flow control agent.

32. The method of claim 31 wherein the viscosity modifier/flow control agent is selected from the group consisting of silica, clay and mixtures thereof.

33. The method of claim 29 further including combining about 0.25 to 1.00 wt % of at least one organotin compound.

34. The method of claim 33 wherein the organotin compound is selected from the group consisting of alkylated tin IV compounds, dibutyltin dilaurate, di-n-octyl tin dimercaptide, dibutyltin thioesters, di-n-octyltin maleate, dibutyltin carboxylates and dibutyltin dithioglycolates.

35. The method of claim 29 further including the addition of a dye compound.

36. A method of making an aerosol solvent weld cement composition comprising combining:

about 14.5 to 16.0 wt % of at least one polymer resin;
about 30 to 75 wt % of at least one solvent in which the polymer resin can be dissolved;
about 20 to 40 wt % of at least one aerosol propellant;
about 2.5 to 4.5 wt % of at least one viscosity modifier/flow control agent, and
about 0.25 to 1.00 wt % of at least one organotin compound,

whereby a solvent weld cement that resists gelling when stored in and dispensed from an aerosol container is formed.

37. The method of claim 36 wherein the polymer resin is selected from the group consisting of CPVC, PVC, ABS, acrylic resins and mixtures thereof;
the solvent is selected from the group consisting of tetrahydrofuran, cyclohexanone, butyrolactone, acetone and mixtures thereof;
the propellant is selected from the group consisting of dimethyl ether, propane, butane, isobutane and mixtures thereof;
the viscosity modifier/flow control agent is selected from the group consisting of silica, clay and mixtures thereof; and
the organotin compound is selected from the group consisting of alkylated tin IV compounds, dibutyltin dilaurate, di-n-octyl tin dimercaptide, dibutyltin thioesters, di-n-octyltin maleate, dibutyltin carboxylates and dibutyltin dithioglycolates.

38. The method of claim 36 further including the addition of a dye compound.

39. A method of making an aerosol weld cement composition comprising combining:

about 14.5 wt % of at least one polymer resin;
about 26 wt % of tetrahydrofuran;
about 7 wt % of cyclohexanone;
about 5 wt % of butyrolactone;
about 26 wt % of acetone;
about 30 wt % of at least one aerosol propellant;
about 3.5 wt % of at least one viscosity modifier/flow control agent; and
about 0.5 wt % of at least one organotin compound,

whereby a solvent weld cement that resists gelling when stored in and dispensed

from an aerosol container is formed.

40. The method of claim 39 wherein the polymer resin is selected from the group consisting of CPVC, PVC, ABS, acrylic resins and mixtures thereof;

the solvent is selected from the group consisting of tetrahydrofuran, cyclohexanone, butyrolactone, acetone and mixtures thereof;

the propellant is selected from the group consisting of dimethyl ether, propane, butane, isobutane and mixtures thereof;

the viscosity modifier/flow control agent is selected from the group consisting of silica, clay and mixtures thereof; and

the organotin compound is selected from the group consisting of alkylated tin IV compounds, dibutyltin dilaurate, di-n-octyl tin dimercaptide, dibutyltin thioesters, di-n-octyltin maleate, dibutyltin carboxylates and dibutyltin dithioglycolates.

41. The method of claim 39 further including the addition of a dye compound.

ABSTRACT

Solvent weld cement (SWC) is used to fuse polymer pipes together. SWC is conventionally dispensed in liquid form from an open container by a swab or brush, resulting in release of fumes, oxidation and contamination of the SWC, as well as environmental contamination due to spilled SWC. A SWC is provided which remains stable while being stored in and dispensed from an aerosol container. The SWC composition comprises a polymer resin, CPVC, a solvent system including tetrahydrofuran, and at least one conventional propellant to allow the SWC to be dispensed from an aerosol container. The resulting SWC remains stable during storage, and when dispensed from the aerosol can provides a SWC with improved uniformity of application, ease of application, greater set-up time, and a SWC which is environmentally friendly.

Docket No. 701069 19

PTO/SD/01 (12-97)
Approved for use through 9/30/00. OMB 0651-0032
Patent and Trademark Office: U.S. Department of Commerce

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION (37 CFR 1.63)			
		Attorney Docket Number	701069.19
		First Named Inventor	MACHER et al
		COMPLETE IF KNOWN	
		Application Number	
[X] Declaration Submitted With Initial Filing **OR**	[ ] Declaration Submitted after Initial Filing (surcharge (37 CFR 1.16 (e)) Required)	Filing Date	Herewith
		Group Art Unit	
		Examiner Name	

As a below named inventor, I hereby declare that:

My residence, post office address, and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint invention (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

SOLVENT WELD CEMENT COMPOSITION IN AEROSOL FORM

(Title of the Invention)

the specification of which

[X] is attached hereto
OR
[ ] was filed on (MM/DD/YYYY) _____ as United States Application Number or PCT International Application Number _____ and was amended on (MM/DD/YYYY) _____ _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or of any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application (numbers)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached? Yes	No
			[ ]	[ ]	[ ]
			[ ]	[ ]	[ ]
			[ ]	[ ]	[ ]

[ ] Additional foreign application numbers are listed on a supplemental priority data sheet PTO/SB/02B

I hereby claim the benefit under 35 U.S.C. 119(e) of any United States provisional application(s) listed below.

Application Number(s)	**Filing Date (MM/DD/YYYY)**	[ ] Additional provisional application numbers are list on a supplemental priority data sheet PTO/SB/02B attached hereto.
60/195,502	April 6, 2000	

PTO/SD/01 (12-97)
Approved for use through 9/30/00. OMB 0651-0032
Patent and Trademark Office: U.S. Department of Commerce

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number

DECLARATION – Utility or Design Patent Application

I hereby claim the benefit under 35 U.S.C. 120 of any United States application(s), or 365(c) of any PCT international application designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT international application in the manner provided by the first paragraph of 35 U.S.C. 112, I acknowledge the duty to disclose information which is material to patentability as defined n 37 CFR 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

U.S. Parent Application or PCT Parent Number	Parent Filing Date (MM/DD/YYYY)	Parent Patent Number *(if applicable)*

[ ] Additional U.S. or PCT international application numbers are listed on a supplement priority data sheet PTO/SB/02B attached hereto.

As a named inventor, I hereby appoint the following registered practitioner(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

[X] Registered practitioner(s) name/registration number listed below

Name	Registration No.	Name	Registration No.
Samuel Digirolamo	29,915	Sarah Pfeifer Vaz	34,747
Rebecca J. Brandau	33,654	Mitchell L. Crain	37,299
Eric N. Kohli	43,726	Robert J. Lewis	27,210
Kyle L. Elliott	39,485	Lawrence E. Evans	29,531

[ ] Additional registered practitioner(s) named on supplemental Registered Practitioner Information sheet PTO/SB/02C attached hereto.

Direct all correspondence to: [X] Correspondence address below

Name	Samuel Digirolamo						
Address	Blackwell Sanders Peper Martin LLP						
Address	720 Olive Street, Suite 2400						
City	St. Louis			**State**	MO	**ZIP**	63101
Country	USA	**Telephone**	(314) 345-6000			**Fax**	(314) 345-6060

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Name of Sole or first Inventor: [ ] A petition has been filed for this unsigned inventor

Given Name (first and middle [if any])	Family Name or Surname
Robert J.	Macher

Inventor's Signature	Robert J Macher					Date 10/10/00	
Residence: City	Fenton	State	MO	Country	USA	Citizenship	US
Post Office Address:	777 River Hills Drive						
City:	Fenton	State	MO	Zip	63026	Country	US

[X] Additional inventors are being named on the 1 supplemental Additional Inventor(s) sheet(s) PTO/SB/02A attached hereto.

PTO/SD/02A (3-97)
Approved for use through 9/30/98. OMB 0651-0032
Patent and Trademark Office: U.S. Department of Commerce

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number

DECLARATION Atty. Dkt. No. 701069.19	ADDITIONAL INVENTOR(S) Supplemental Sheet Page 1 of 1

Name of Additional Joint Invention, If any:							[ ] A petition has been filed for this unsigned inventor
Given Name (first and middle [if any])				Family Name or Surname			
Allen L.				Smith			
Inventor's Signature	Allen L Smith					Date	10/10/00
Residence: City	St. Louis	State	MO	Country	USA	Citizenship	US
Post Office Address:	9047 Amona Drive						
Post Office Address:							
City:	St. Louis	State	MO	Zip	63123	Country	USA

Name of Additional Joint Inventor, if any:							[ ] A petition has been filed for this unsigned inventor
Given Name (first and middle [if any])				Family Name or Surname			
Inventor's Signature						Date	
Residence: City		State		Country		Citizenship	
Post Office Address:							
Post Office Address:							
City:		State		Zip		Country	

Name of Additional Joint Invention, If any:							[ ] A petition has been filed for this unsigned inventor
Given Name (first and middle [if any])				Family Name or Surname			
Inventor's Signature						Date	
Residence: City		State		Country		Citizenship	
Post Office Address:							
Post Office Address:							
City:		State		Zip		Country	

Burden Hour Statement: This form is estimated to take 0 4 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, D C 20231. DO NOT SENT FEES OR COMPLETED FORMS TO THIS ADDRESS SEND TO Assistant Commissioner for Patents, Washington, DC 20231.STLD01-824542-1